Claims

1. A method for generating a broadband light sideband, comprising the steps of:
inputting a light beam from a predetermined light source to an electro-optic phase modulator;
generating a light sideband sequence by subjecting a phase modulation to said light beam in said electro-optic phase modulator; and
making an intensity distribution of said light sideband sequence uniform by setting a predetermined spatial distribution of a phase modulation index in consideration with the spatial distribution of said light beam in said electro-optic phase modulator.

2. The method for generating a broadband light sideband according to claim 1, wherein the spatial distribution of said phase modulation index is formed by controlling a configuration of an electrode in said electro-optic phase modulator.

3. The method for generating a broadband light sideband according to claim 1, wherein the spatial distribution of said phase modulation index is formed by operating a polarization reversal technique in said electro-optic phase modulator.

4. The method for generating a broadband light sideband according to claim 3, wherein said polarization reversal technique is performed by reversing a crystal axis of an electro-optic crystal in said electro-optic phase modulator with a period L defined in the formula $L=[2fm(1/Vgopt-1/Vpmod)]^{-1}$ (fm : a frequency of the modulation wave, Vgopt : a group velocity of said light beam, Vpmod : a phase velocity of the modulation wave).

5. The method for generating a broadband light sideband according to claim 4, wherein the spatial distribution g(x) of said phase modulation index is represented by the formula $g(x) = 8nmL / \lambda \sin (\pi W(x) / (2L))$, (nm : a change in the refraction index of the electro-optic crystal caused by the phase modulation, λ : a wavelength of the light beam, L : a period of the polarization reversal, W(x) : a polarization reversal width).

6. The method for generating a broadband light sideband according to any one of claims 1 to 5, further comprising a step of performing a spatial Fourier transformation on an output light beam including said light sideband sequence after emitted from said electro-optic phase modulator.

7. The method for generating a broadband light sideband according to claim 6, wherein said spatial Fourier transformation is performed by using a convex lens.

8. The method for generating a broadband light sideband according to claim 6, wherein said spatial Fourier transformation is performed by using a concave mirror.

9. An apparatus for generating a broadband light sideband comprising:

a predetermined light source; and

an electro-optic phase modulator for generating a light sideband sequence by subjecting a phase modulation to a light beam emitted from said light source and making an intensity distribution of said light sideband uniform by setting a predetermined spatial distribution of the phase modulation index in consideration with the spatial distribution of said light beam.

10. The apparatus for generating a broadband light sideband according to claim 9, wherein said electro-optic phase modulator comprises an electrode controlled into a predetermined configuration for generating said spatial distribution of the phase modulation index.

11. The apparatus for generating a broadband light sideband according to claim 10, wherein a polarization reversal technique is applied to said electro-optic phase modulator for generating said spatial distribution of the phase modulation index.

12. The apparatus for generating a broadband light sideband according to claim 11, wherein said polarization reversal technique is performed by reversing a crystal axis of an electro-optic crystal in said electro-optic phase modulator with a period L defined in the formula $L=[2fm(1/Vgopt-1/Vpmod)]^{-1}$ (fm : a frequency of the modulation wave, Vgopt : a group velocity of said light beam, Vpmod : a phase

velocity of the modulation wave).

13. The apparatus for generating a broadband light sideband according to claim 12, wherein the spatial distribution g(x) of said phase modulation index is represented by the formula $g(x) = 8nmL / \lambda \sin (\pi W (x) / (2L))$, (nm : a change in the refraction index of the electro-optic crystal caused by the phase modulation, λ : a wavelength of the light beam, L : a period of the polarization reversal, W(x) : a polarization reversal width).

14. The apparatus for generating a broadband light sideband according to any one of claims 9 to 13, further comprising a means for performing a spatial Fourier transformation on the output light beam including said light sideband after emitted from said electro-optic phase modulator.

15. The apparatus for generating a broadband light sideband according to claim 14, wherein said means for operating a spatial Fourier transformation comprises a convex lens.

16. The apparatus for generating a broadband light sideband according to claim 14, wherein said means for operating a spatial Fourier transformation comprises a concave mirror.

17. The apparatus for generating a broadband light sideband according to any one of claims 9 to 16, further comprising a light beam output means for outputting an output light beam including said light sideband sequence.

18. The apparatus for generating a broadband light sideband according to claim 17, wherein said light beam output means comprises a diffraction grating.

19. The apparatus for generating a broadband light sideband according to claim 15, further comprising a light beam output means for outputting an output light beam including said light sideband sequence, wherein said light beam output means comprises a diffraction plate provided with a slit placed at a focal point of said convex lens and an additional convex lens.

20. The apparatus for generating a broadband light sideband according

to claim 15, further comprising a light beam output means for outputting an output light beam including said light sideband sequence, wherein said light beam output means comprises an optical fiber.